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# Recent Legume Variety Trials in South Dakota

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# RECENT LEGUME VARIETY TRIALS

# in

# SOUTH DAKOTA

Agricultural Experiment Station
Agronomy Department
South Dakota State College
Brookings, South Dakota

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# Recent Legume Variety Trials in South Dakota



by

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Varietal tests of the more important forage legume species are conducted on a continuing basis as a part of the forage legume breeding project of the Agronomy Department of the South Dakota Agricultural Experiment Station. While these tests are rather restricted in size and distribution, they do attempt to provide impartial evaluation of the varieties most apt to be widely used in the state. Test locations are, for the most part, concentrated in the areas where these species are used most extensively or where they are well adapted. Recent results with alfalfa, sweetclover, red clover, and birdsfoot trefoil are included in this report.

The data presented should be interpreted with caution. In many cases they are limited to one or a few years. Differences in winter-hardiness, resistance to diseases and insects, and in quality of forage may not be revealed by short term yield figures. These results are of a preliminary nature and inclusion of a variety in the tests does not indicate that it is recommended for use in South Dakota. A list of legume forage varieties eligible for certification and recommended for use within the state will be found in table 38.

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2/ The authors wish to extend their appreciation to Dr. M. W. Adams, formerly Agronomist, South Dakota Agricultural Experiment Station, Brookings, for much of the data presented for the years prior to 1959.

Table 1. Alfalfa Variety Test at the Main Experiment Station, Brookings. Seeded 1948. Harvested 1949, 1951, 1952 and 1953.

| Variety | Tons of dry forage per acre | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1949 | | 1951 | | 1952 | | 1953 | Cumulative Average | | |
| | 1st cut | 2nd cut | 1st cut | 2nd cut | 1st cut | 2nd cut | 1st cut 1/ | 1st cut | 2nd cut | Total |
| Atlantic | 3.88 | 3.21 | 1.94 | 1.18 | 2.14 | 1.19 | 2.26 | 2.56 | 1.86 | 3.95 |
| Buffalo | 2.98 | 2.48 | 1.78 | 1.32 | 1.92 | 1.20 | 2.33 | 2.25 | 1.67 | 3.50 |
| Grimm | 4.46 | 2.70 | 2.03 | 1.16 | 1.66 | 1.23 | 2.28 | 2.61 | 1.70 | 3.88 |
| Kansas Common | 4.08 | 2.20 | 1.66 | 1.22 | 1.52 | 1.28 | 2.29 | 2.39 | 1.57 | 3.56 |
| Ladak | 5.11 | 2.92 | 2.15 | 1.31 | 2.17 | 1.19 | 2.49 | 2.98 | 1.81 | 4.34 |
| Narragansett | 4.80 | 3.05 | 2.23 | 1.24 | 2.17 | 1.02 | 2.42 | 2.90 | 1.77 | 4.23 |
| Oklahoma Common | 3.74 | 2.61 | 1.54 | 1.34 | 1.57 | 1.08 | 2.39 | 2.31 | 1.68 | 3.57 |
| Ranger | 4.30 | 2.39 | 1.97 | 1.28 | 1.91 | 1.14 | 2.03 | 2.55 | 1.60 | 3.76 |
| Williamsburg | 3.54 | 2.92 | 1.73 | 1.29 | 1.89 | 1.06 | 2.37 | 2.38 | 1.76 | 3.70 |
| Average | 4.10 | 2.72 | 1.89 | 1.26 | 1.88 | 1.15 | 2.32 | 2.55 | 1.71 | 3.83 |

1/ Only one cutting obtained.

Table 2. Alfalfa Variety Test at the Main Experiment Station, Brookings. Seeded 1950. Harvested 1951, 1952, 1953 and 1954.

| Variety | Tons of dry forage per acre | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1951 | 1952 | | | 1953 | 1954 | Average seasonal |
| | 1st cut 1/ | 1st cut | 2nd cut | Total | 1st cut 1/ | 1st cut 1/ | Total |
| Atlantic | 0.78 | 2.40 | 1.14 | 3.54 | 2.07 | 1.47 | 1.96 |
| Du Puits | 0.70 | 2.27 | 1.21 | 3.48 | 1.74 | 1.38 | 1.82 |
| Ladak | 0.97 | 2.91 | 0.95 | 3.86 | 2.00 | 1.73 | 2.14 |
| Narragansett | 0.84 | 2.52 | 1.19 | 3.71 | 1.98 | 1.48 | 2.00 |
| Nomad | 0.79 | 2.12 | 0.80 | 2.92 | 1.87 | 1.40 | 1.74 |
| Ranger | 0.75 | 2.36 | 1.03 | 3.39 | 1.92 | 1.40 | 1.86 |
| Sevelra | 0.77 | 2.25 | 1.10 | 3.35 | 2.10 | 1.51 | 1.93 |
| South Dakota Common | 0.74 | 2.50 | 1.19 | 3.69 | 2.07 | 1.62 | 2.03 |
| Talent | 0.63 | 2.00 | 1.06 | 3.06 | 1.81 | 1.11 | 1.65 |
| Williamsburg | 0.72 | 2.26 | 1.13 | 3.39 | 1.95 | 1.48 | 1.88 |
| Average | 0.77 | 2.36 | 1.08 | 3.44 | 1.95 | 1.46 | 1.90 |

1/ Only one cutting obtained.

Table 3. Alfalfa variety test at the Main Experiment Station, Brookings, South Dakota. Seeded 1959. Harvested 1960-1961.

| Variety | Percent Stand May 16, 1961 | Yield (Dry Tons/Acre) 1960 Total | 1961 1st Cut | 1961 2nd Cut | 1961 3rd Cut | 1961 Total | Ave. Total | Rank |
|---|---|---|---|---|---|---|---|---|
| Northrup N9-502 | 92 | 2.26 | 2.66 | 1.56 | 1.14 | 5.36 | 3.81 | 13 |
| Northrup N9-503 | 85 | 2.40 | 2.76 | 1.50 | 1.12 | 5.38 | 3.89 | 10 |
| Northrup N9-504 | 93 | 2.67 | 2.86 | 1.54 | 1.12 | 5.52 | 4.10 | 7 |
| P.A.G.F.D. 100 | 93 | 2.28 | 2.56 | 1.43 | 1.04 | 5.03 | 3.66 | 18 |
| Scandia | 91 | 2.29 | 2.53 | 1.50 | 1.08 | 5.11 | 3.70 | 15 |
| Starcross | 95 | 2.36 | 2.77 | 1.57 | 1.04 | 5.38 | 3.87 | 11 |
| Atlantic | 86 | 2.13 | 2.58 | 1.44 | 1.07 | 5.09 | 3.61 | 19 |
| Buffalo | 92 | 2.25 | 2.53 | 1.52 | 1.08 | 5.13 | 3.69 | 16 |
| CK | 81 | 2.28 | 2.82 | .88 | .48 | 4.18 | 3.23 | 24 |
| Cody | 90 | 2.13 | 2.23 | 1.44 | 1.06 | 4.73 | 3.43 | 22 |
| Cossack | 95 | 2.68 | 2.55 | 1.51 | 1.06 | 5.12 | 3.90 | 9 |
| DuPuits | 96 | 2.31 | 2.72 | 1.56 | 1.14 | 5.42 | 3.86 | 12 |
| Grimm | 92 | 2.69 | 2.92 | 1.51 | 1.10 | 5.53 | 4.11 | 6 |
| Ladak | 84 | 2.83 | 3.20 | 1.29 | 1.00 | 5.49 | 4.16 | 3 |
| Lahontan | 88 | 1.23 | 1.56 | 1.06 | .85 | 3.47 | 2.35 | 25 |
| Narragansett | 93 | 2.96 | 3.04 | 1.48 | 1.00 | 5.52 | 4.24 | 2 |
| Nomad | 90 | 2.13 | 2.65 | 1.32 | .91 | 4.88 | 3.50 | 20 |
| Rambler | 91 | 2.71- | 2.84 | 1.04 | .75 | 4.63 | 3.67 | 17 |
| Ranger | 92 | 2.40 | 2.85 | 1.50 | 1.10 | 5.45 | 3.92 | 8 |
| Rhizoma | 95 | 2.81 | 3.13 | 1.38 | .91 | 5.42 | 4.12 | 5 |
| Semipalatinsk | 98 | 3.01 | 3.15 | 1.22 | .86 | 5.23 | 4.12 | 4 |
| Teton | 82 | 2.26 | 2.79 | 1.06 | .73 | 4.58 | 3.42 | 23 |
| Tuna | 94 | 2.12 | 2.57 | 1.44 | .87 | 4.88 | 3.50 | 21 |
| Vernal | 98 | 2.96 | 3.06 | 1.48 | 1.09 | 5.63 | 4.30 | 1 |
| Williamsburg | 92 | 2.25 | 2.59 | 1.50 | 1.18 | 5.27 | 3.76 | 14 |
| Average | | 2.42 | 2.72 | 1.39 | .99 | 5.10 | 3.76 | |
| L.S.D. (0.05) | | .43 | .51 | .21 | .22 | .70 | .50 | |
| (0.01) | | .51 | .68 | .28 | .29 | N.S. | .68 | |

Table 4. Alfalfa variety test at the Range Field Station, Cottonwood, South Dakota. Seeded 1959. Harvested 1960-1961.

| Variety | Yield (Dry Tons/Acre) 1960 Total | 1961 Total 1/ | Average Total | Rank |
|---|---|---|---|---|
| Northrup N9-502 | 2.58 | .65 | 1.62 | 3 |
| Northrup N9-503 | 2.65 | .60 | 1.62 | 2 |
| Northrup N9-504 | 2.71 | .63 | 1.67 | 1 |
| P.A.G. F.D. 100 | 2.61 | .54 | 1.58 | 4 |
| Scandia | 1.84 | .46 | 1.15 | 22 |
| Starcross | 2.26 | .72 | 1.49 | 6 |
| Atlantic | 2.08 | .58 | 1.33 | 14 |
| Buffalo | 1.97 | .62 | 1.30 | 16 |
| CK | 1.44 | .32 | .88 | 25 |
| Cody | 2.23 | .56 | 1.40 | 13 |
| Cossack | 2.34 | .59 | 1.46 | 7 |
| DuPuits | 2.28 | .57 | 1.42 | 10-11 |
| Grimm | 2.13 | .51 | 1.32 | 15 |
| Ladak | 2.27 | .64 | 1.46 | 8 |
| Lahontan | 1.98 | .50 | 1.24 | 17 |
| Narragansett | 2.42 | .62 | 1.52 | 5 |
| Nomad | 1.83 | .53 | 1.18 | 21 |
| Rambler | 2.25 | .60 | 1.42 | 10-11 |
| Ranger | 1.81 | .59 | 1.20 | 20 |
| Rhizoma | 2.32 | .57 | 1.44 | 9 |
| Semipalatinsk | 1.86 | .43 | 1.14 | 23 |
| Teton | 1.47 | .36 | .92 | 24 |
| Tuna | 2.20 | .63 | 1.42 | 12 |
| Vernal | 1.82 | .63 | 1.22 | 19 |
| Williamsburg | 1.86 | .60 | 1.23 | 18 |
| Average | 2.13 | .56 | 1.35 | |
| L.S.D. (0.05) | .23 | .14 | .42 | |
| (0.01) | .32 | .19 | N.S. | |

1/ Only one cutting obtained due to drought.

Table 5. Alfalfa variety test at the North Central Substation, Eureka, South Dakota. Seeded 1959. Harvested 1960-1961.

| Variety | Yield (Dry Tons/Acre) 1960 Total 1/ | 1961 Total 1/ | Average Total | Rank |
|---|---|---|---|---|
| Northrup N9-502 | .67 | .85 | .76 | 11 |
| Northrup N9-503 | .65 | .64 | .64 | 18 |
| Northrup N9-504 | .96 | .97 | .96 | 5 |
| P.A.G.F.D. 100 | .91 | 1.04 | .98 | 3 |
| Scandia | .61 | .44 | .52 | 25 |
| Starcross | .56 | .62 | .59 | 22 |
| Atlantic | .66 | .83 | .74 | 13 |
| Buffalo | .42 | .73 | .58 | 23 |
| CK | .67 | 1.15 | .91 | 7 |
| Cody | .44 | .82 | .63 | 19 |
| Cossack | .64 | .83 | .74 | 14 |
| DuPuits | .68 | .82 | .75 | 12 |
| Grimm | .47 | .84 | .66 | 17 |
| Ladak | .89 | 2.24 | 1.56 | 1 |
| Lahontan | .46 | .63 | .54 | 24 |
| Narragansett | .79 | .95 | .87 | 9 |
| Nomad | .50 | .72 | .61 | 20 |
| Rambler | .82 | .98 | .90 | 8 |
| Ranger | .62 | .94 | .78 | 10 |
| Rhizoma | .65 | .75 | .70 | 15 |
| Semipalatinsk | .77 | 1.17 | .97 | 4 |
| Teton | .56 | .64 | .60 | 21 |
| Tuna | .80 | 1.08 | .94 | 6 |
| Vernal | .97 | 1.18 | 1.08 | 2 |
| Williamsburg | .56 | .79 | .68 | 16 |
| Average | .66 | .91 | .79 | |
| L.S.D. (0.05) | N.S. | .30 | .40 | |
| (0.01) | N.S. | .40 | .54 | |

1/ Only one cutting obtained due to drought.

Table 6. Alfalfa Variety Test at the Central Substation, Highmore. Seeded 1956. Harvested 1957-1960.

| Variety | Tons of dry forage per acre | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1957 | | | 1958 | 1959 | 1960 | Average |
| | 1st cut | 2nd cut | Total | Total | Total | Total | Seasonal Total |
| Arizona Chilean | 1.32 | 1.96 | 3.28 | 1.19 | .00 | .00 | 1.12 |
| Buffalo | 1.92 | 2.50 | 4.41 | 1.20 | .44 | .87 | 1.73 |
| California Common | 1.89 | 2.23 | 4.12 | 1.20 | .16 | .20 | 1.42 |
| Cossack | 2.34 | 2.51 | 4.85 | 1.16 | .52 | 1.00 | 1.88 |
| Du Puits | 2.30 | 2.65 | 4.95 | 1.50 | .32 | .58 | 1.84 |
| Grimm | 2.06 | 2.70 | 4.76 | 1.32 | .56 | 1.07 | 1.93 |
| Ladak | 1.89 | 2.19 | 4.08 | 1.51 | .58 | 1.24 | 1.85 |
| Lahontan | 1.41 | 1.96 | 3.36 | 1.24 | .26 | .27 | 1.28 |
| Narragansett | 2.01 | 2.70 | 4.72 | 1.33 | .60 | 1.10 | 1.94 |
| Nomad | 1.63 | 2.00 | 3.63 | 1.23 | .40 | .74 | 1.50 |
| Ranger | 1.94 | 2.76 | 4.70 | 1.44 | .56 | 1.29 | 2.00 |
| Semipalatinsk | 1.85 | 2.03 | 3.88 | 1.70 | .57 | 1.19 | 1.84 |
| Vernal | 2.10 | 2.17 | 4.26 | 1.57 | .76 | 1.30 | 1.97 |
| Average | 1.90 | 2.34 | 4.23 | 1.35 | .44 | .83 | 1.71 |
| L.S.D. (0.05) | | | | | N.S. | N.S. | .42 |
| (0.01) | | | | | N.S. | N.S. | .57 |

Table 7. Alfalfa Variety Test at the Southeast Experimental Farm, Menno, South Dakota. Seeded 1956. Harvested 1957-1960.

| Variety | Tons dry forage per acre | | | | |
|---|---|---|---|---|---|
| | 1957 | 1958 | 1959 | 1960 | Average |
| Cossack | 5.28 | 1.52 | 2.17 | 3.80 | 3.19 |
| Du Puits | 5.37 | 1.62 | 1.55 | 3.06 | 2.90 |
| Grimm | 4.42 | 1.64 | 1.72 | 4.10 | 2.97 |
| Ladak | 5.15 | 1.43 | 1.52 | 3.57 | 2.92 |
| Lahontan | 4.51 | 1.48 | 1.52 | 2.84 | 2.59 |
| Narragansett | 5.17 | 1.76 | 2.33 | 3.66 | 3.23 |
| Nomad | 4.44 | 1.23 | 2.14 | 3.61 | 2.86 |
| Ranger | 5.30 | 1.59 | 1.94 | 3.52 | 3.09 |
| Rhizoma | 5.25 | 1.68 | 1.98 | 3.86 | 3.19 |
| Terra Verde | 5.36 | 1.79 | .71 | 1.36 | 2.30 |
| Teton | 4.83 | 1.00 | 1.53 | 3.43 | 2.70 |
| Vernal | 5.12 | 2.00 | 1.99 | 4.09 | 3.30 |
| Average | 5.02 | 1.56 | 1.76 | 3.41 | 2.94 |
| L.S.D. (0.05) | N.S. | .18 | .73 | .67 | N.S. |

Table 8. Alfalfa variety test at the Redfield Irrigation Farm, Redfield, South Dakota. Seeded 1959, Harvested 1960-61.

| Entry | Yield (Dry Tons/Acre) 1960 Total | 1961 1st Cut | 1961 2nd Cut | 1961 3rd Cut | 1961 Total | Average Total | Rank |
|---|---|---|---|---|---|---|---|
| Northrup N9-502 | 3.41 | 2.37 | 1.53 | 1.40 | 5.31 | 4.36 | 12 |
| Northrup N9-503 | 4.64 | 2.44 | 1.50 | 1.54 | 5.48 | 5.06 | 2 |
| Northrup N9-504 | 3.89 | 2.51 | 1.50 | 1.52 | 5.54 | 4.72 | 6 |
| P.A.G.F.D. 100 | 4.02 | 1.98 | 1.47 | 1.23 | 4.68 | 4.35 | 13 |
| Scandia | 3.44 | 2.24 | 1.40 | 1.32 | 4.95 | 4.20 | 16 |
| Starcross | 4.49 | 2.61 | 1.53 | 1.48 | 5.62 | 5.06 | 3 |
| Atlantic | 4.38 | 2.27 | 1.33 | 1.36 | 4.96 | 4.67 | 8 |
| Buffalo | 4.19 | 2.35 | 1.21 | 1.25 | 4.81 | 4.50 | 10 |
| CK | 3.36 | 2.09 | 1.00 | 1.00 | 4.09 | 3.72 | 22 |
| Cody | 3.51 | 2.04 | 1.01 | 1.22 | 4.26 | 3.88 | 21 |
| Cossack | 4.15 | 2.38 | 1.30 | 1.37 | 5.06 | 4.60 | 9 |
| DuPuits | 3.71 | 2.00 | 1.39 | 1.22 | 4.61 | 4.16 | 17 |
| Grimm | 4.31 | 2.72 | 1.35 | 1.42 | 5.50 | 4.90 | 5 |
| Ladak | 4.14 | 2.46 | 1.48 | 1.30 | 5.24 | 4.69 | 7 |
| Lahontan | 3.42 | 1.80 | 1.38 | 1.41 | 4.59 | 4.00 | 20 |
| Narragansett | 4.65 | 2.40 | 1.46 | 1.56 | 5.42 | 5.04 | 4 |
| Nomad | 2.87 | 1.82 | 1.11 | 1.22 | 4.15 | 3.51 | 25 |
| Rambler | 4.20 | 2.05 | 1.11 | 1.14 | 4.30 | 4.25 | 15 |
| Ranger | 3.26 | 2.27 | 1.41 | 1.34 | 5.02 | 4.14 | 19 |
| Rhizoma | 3.96 | 2.11 | 1.27 | 1.26 | 4.64 | 4.30 | 14 |
| Semipalatinsk | 2.92 | 2.38 | 1.00 | 1.07 | 4.44 | 3.68 | 23 |
| Teton | 3.26 | 1.72 | 1.08 | 1.03 | 3.82 | 3.54 | 24 |
| Tuna | 4.14 | 2.04 | 1.32 | 1.26 | 4.62 | 4.38 | 11 |
| Vernal | 4.99 | 2.75 | 1.66 | 1.47 | 5.83 | 5.44 | 1 |
| Williamsburg | 3.46 | 1.94 | 1.36 | 1.52 | 4.84 | 4.15 | 18 |
| Average | 3.87 | 2.23 | 1.33 | 1.32 | 4.87 | 4.37 | |
| L.S.D. (0.05) | .28 | N.S. | .39 | N.S. | .48 | .65 | |
| (0.01) | .38 | N.S. | N.S. | N.S. | .65 | .88 | |

Table 9. Alfalfa Variety Test at the Northeast Research Farm, Watertown, South Dakota. Seeded 1956. Harvested 1957-1960.

| Variety | Tons of dry forage per acre | | | | |
|---|---|---|---|---|---|
| | 1957 | 1958 | 1959 | 1960 | Average |
| Cossack | 3.76 | 2.68 | .30 | 1.37 | 2.03 |
| Du Puits | 3.89 | 2.70 | --- | --- | 1.65 |
| Grimm | 4.06 | 2.63 | .75 | 1.80 | 2.31 |
| Ladak | 4.74 | 2.79 | .47 | 1.66 | 2.42 |
| Lahontan | 2.76 | 1.69 | --- | --- | 1.11 |
| Narragansett | 4.25 | 2.88 | .38 | 1.61 | 2.28 |
| Nomad | 3.48 | 2.22 | .08 | .83 | 1.65 |
| Ranger | 4.06 | 2.57 | .41 | 1.75 | 2.20 |
| Rhizoma | 3.62 | 2.35 | .14 | .85 | 1.74 |
| Terra Verde[1/] | --- | --- | --- | --- | --- |
| Teton | 4.18 | 2.46 | .54 | 1.96 | 2.28 |
| Vernal | 4.44 | 3.13 | .42 | 1.63 | 2.40 |
| Average | 3.93 | 2.55 | .32 | 1.50 | 2.01 |
| L.S.D.(0.05) | .44 | .24 | .27 | .25 | .45 |
| (0.01) | .63 | .34 | .37 | .36 | .60 |

1/ Winter killed and excluded from averages.

Table 10. Alfalfa variety test at the Northeast Research Farm, Watertown, South Dakota. Seeded 1960. Harvested 1961.

| Variety | Per Cent Stand May, 1961 | Dry Tons Per Acre 1st Cut | 2nd Cut | Total |
|---|---|---|---|---|
| Atlantic | 96 | 1.22 | .96 | 2.18 |
| Buffalo | 100 | 1.10 | .81 | 1.91 |
| CK | 88 | .69 | .96 | 1.64 |
| Cody | 97 | .89 | .79 | 1.68 |
| Cossack | 98 | 1.26 | .92 | 2.18 |
| Culver | 98 | 1.12 | .92 | 2.04 |
| DuPuits | 98 | 1.19 | .96 | 2.15 |
| Grimm | 100 | 1.14 | .88 | 2.01 |
| Ladak | 99 | 1.36 | .84 | 2.20 |
| Lahontan | 93 | .47 | .70 | 1.17 |
| Narragansett | 98 | 1.41 | .87 | 2.28 |
| Nomad | 98 | .98 | .74 | 1.72 |
| Ranger | 98 | 1.20 | .81 | 2.02 |
| Rambler | 98 | 1.46 | .93 | 2.40 |
| Rhizoma | 99 | 1.32 | .82 | 2.14 |
| Semipalatinsk | 98 | 1.37 | 1.06 | 2.42 |
| Teton | 94 | 1.06 | .94 | 2.00 |
| Vernal | 98 | 1.31 | .93 | 2.24 |
| Average | 97 | 1.14 | .88 | 2.02 |
| L.S.D. (0.05) | | .27 | N.S. | N.S. |
| (0.01) | | .36 | N.S. | N.S. |

Table 11. Alfalfa variety test at the Northeast Research Farm, Watertown, South Dakota. Seeded 1960. Harvested 1961.

| Entry | Per Cent Stand (5/10/61) | Yield (Dry Tons/Acre) | | | |
|---|---|---|---|---|---|
| | | 1st Cut | 2nd Cut | Total | Rank |
| Waterman-Loomis 200 | 94 | 1.17 | .58 | 1.76 | 8 |
| Waterman-Loomis 300 | 96 | 1.16 | .72 | 1.88 | 6 |
| Waterman-Loomis 400 | 90 | .64 | .88 | 1.52 | 9 |
| Waterman-Loomis H.L.K. | 96 | 1.36 | .78 | 2.14 | 1 |
| Northrup-King N9-504 | 92 | 1.37 | .73 | 2.10 | 2 |
| Northrup-King N9-503 | 98 | 1.28 | .64 | 1.92 | 4 |
| Northrup-King N9-502 | 100 | 1.21 | .66 | 1.87 | 7 |
| Taylor-Walcot FD 100 | 96 | 1.19 | .70 | 1.89 | 5 |
| Vernal | 96 | 1.41 | .62 | 2.03 | 3 |
| Average | 95 | 1.20 | .70 | 1.90 | |
| L.S.D. (0.05) | | .21 | N.S. | .25 | |
| (0.01) | | .28 | N.S. | N.S. | |

Table 12. Summary of the mean annual forage yield of alfalfa varieties at four locations in South Dakota. Based upon the data included in tables 3,4,5, and 8. Seeded 1959. Harvested 1960-61.

| Variety | Yield (Dry Tons/Acre) | | | | | |
|---|---|---|---|---|---|---|
| | Brookings | Cottonwood | Eureka | Redfield | Average | Rank |
| Northrup N9-502 | 3.81 | 1.62 | .76 | 4.36 | 2.64 | 11 |
| Northrup N9-503 | 3.89 | 1.62 | .64 | 5.06 | 2.80 | 5 |
| Northrup N9-504 | 4.10 | 1.67 | .96 | 4.72 | 2.86 | 4 |
| P.A.G. F.D. 100 | 3.66 | 1.58 | .98 | 4.35 | 2.64 | 9 |
| Scandia | 3.70 | 1.15 | .52 | 4.20 | 2.39 | 20 |
| Starcross | 3.87 | 1.49 | .59 | 5.06 | 2.75 | 6 |
| Atlantic | 3.61 | 1.33 | .74 | 4.67 | 2.59 | 12 |
| Buffalo | 3.69 | 1.30 | .58 | 4.50 | 2.52 | 16 |
| CK | 3.23 | .88 | .91 | 3.72 | 2.18 | 23 |
| Cody | 3.43 | 1.40 | .63 | 3.88 | 2.34 | 21 |
| Cossack | 3.90 | 1.46 | .74 | 4.60 | 2.68 | 8 |
| DuPuits | 3.86 | 1.42 | .75 | 4.16 | 2.55 | 15 |
| Grimm | 4.11 | 1.32 | .66 | 4.90 | 2.75 | 7 |
| Ladak | 4.16 | 1.46 | 1.56 | 4.69 | 2.97 | 2 |
| Lahontan | 2.35 | 1.24 | .54 | 4.00 | 2.03 | 25 |
| Narragansett | 4.24 | 1.52 | .87 | 5.04 | 2.92 | 3 |
| Nomad | 3.50 | 1.18 | .61 | 3.51 | 2.20 | 22 |
| Rambler | 3.67 | 1.42 | .90 | 4.25 | 2.56 | 13-14 |
| Ranger | 3.92 | 1.20 | .78 | 4.14 | 2.51 | 17 |
| Rhizoma | 4.12 | 1.44 | .70 | 4.30 | 2.64 | 10 |
| Semipalatinsk | 4.12 | 1.14 | .97 | 3.68 | 2.48 | 18 |
| Teton | 3.42 | .92 | .60 | 3.54 | 2.12 | 24 |
| Tuna | 3.50 | 1.42 | .94 | 4.38 | 2.56 | 13-14 |
| Vernal | 4.30 | 1.22 | 1.08 | 5.44 | 3.01 | 1 |
| Williamsburg | 3.76 | 1.23 | .68 | 4.15 | 2.46 | 19 |
| Average | 3.76 | 1.35 | .79 | 4.37 | 2.57 | |
| L.S.D. (0.05) | .50 | .42 | .40 | .65 | .40 | |
| (0.01) | .68 | N.S. | .54 | .88 | .53 | |

Table 13. Summary of the performance of alfalfa varieties included in the preceding tables.

| Variety | Average tons of dry forage per acre per year | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Brookings | | | Cottonwood | Eureka | Highmore | Menno | Redfield | Watertown | | |
| | 1949-53 | 1951-54 | 1960-61 | 1960-61 | 1960-61 | 1957-60 | 1957-60 | 1960-61 | 1957-60 | 1961 | 1961 |
| Arizona Chilean | ---- | ---- | ---- | ---- | ---- | 1.12 | ---- | ---- | ---- | ---- | ---- |
| Atlantic | 3.95 | 1.96 | 3.61 | 1.33 | .74 | ---- | ---- | 4.67 | ---- | 2.18 | ---- |
| Buffalo | 3.50 | ---- | 3.69 | 1.30 | .58 | 1.73 | ---- | 4.50 | ---- | 1.91 | ---- |
| California Common | ---- | ---- | ---- | ---- | ---- | 1.42 | ---- | ---- | ---- | ---- | ---- |
| CK | ---- | ---- | 3.23 | .88 | .91 | ---- | ---- | 3.72 | ---- | 1.64 | ---- |
| Cody | ---- | ---- | 3.43 | 1.40 | .63 | ---- | ---- | 3.88 | ---- | 1.68 | ---- |
| Cossack | ---- | ---- | 3.90 | 1.46 | .74 | 1.88 | 3.19 | 4.60 | 2.03 | 2.18 | ---- |
| Culver | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 2.04 | ---- |
| DuPuits | ---- | 1.82 | 3.86 | 1.42 | .75 | 1.84 | 2.90 | 4.16 | 1.65 | 2.15 | ---- |
| Grimm | 3.88 | ---- | 4.11 | 1.32 | .66 | 1.93 | 2.97 | 4.90 | 2.31 | 2.01 | ---- |
| Kansas Common | 3.56 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Ladak | 4.34 | 2.14 | 4.16 | 1.46 | 1.56 | 1.85 | 2.92 | 4.69 | 2.42 | 2.20 | ---- |
| Lahontan | ---- | ---- | 2.35 | 1.24 | .54 | 1.28 | 2.59 | 4.00 | 1.11 | 1.17 | ---- |
| Narragansett | 4.23 | 2.00 | 4.24 | 1.52 | .87 | 1.94 | 3.23 | 5.04 | 2.28 | 2.28 | ---- |
| Nomad | ---- | 1.74 | 3.50 | 1.18 | .61 | 1.50 | 2.86 | 3.51 | 1.65 | 1.72 | ---- |
| Oklahoma Common | 3.57 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Rambler | ---- | ---- | 3.67 | 1.42 | .90 | ---- | ---- | 4.25 | ---- | 2.40 | ---- |
| Ranger | 3.76 | 1.86 | 3.92 | 1.20 | .78 | 2.00 | 3.09 | 4.14 | 2.20 | 2.02 | ---- |
| Rhizoma | ---- | ---- | 4.12 | 1.44 | .70 | ---- | 3.19 | 4.30 | 1.74 | 2.14 | ---- |
| Semipalatinsk | ---- | ---- | 4.12 | 1.14 | .97 | 1.84 | ---- | 3.68 | ---- | 2.42 | ---- |
| Sevelra | ---- | 1.93 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| South Dakota Common | ---- | 2.03 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Talent | ---- | 1.65 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Terra Verde | ---- | ---- | ---- | ---- | ---- | ---- | 2.30 | ---- | 1/ | ---- | ---- |
| Teton | ---- | ---- | 3.42 | .92 | .60 | ---- | 2.70 | 3.54 | 2.28 | 2.00 | ---- |
| Tuna | ---- | ---- | 3.50 | 1.42 | .94 | ---- | ---- | 4.38 | ---- | ---- | ---- |
| Vernal | ---- | ---- | 4.30 | 1.22 | 1.08 | 1.97 | 3.30 | 5.44 | 2.40 | 2.24 | 2.03 |
| Williamsburg | 3.70 | 1.88 | 3.76 | 1.23 | .68 | ---- | ---- | 4.15 | ---- | ---- | ---- |

Table 13 (Continued). Summary of the performance of alfalfa varieties included in the preceding tables.

| Variety | Average tons of dry forage per acre per year | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Brookings | | | Cottonwood | Eureka | Highmore | Menno | Redfield | Watertown | | |
| | 1949-53 | 1951-54 | 1960-61 | 1960-61 | 1960-61 | 1957-60 | 1957-60 | 1960-61 | 1957-60 | 1961 | 1961 |
| Northrup N9-502 | ---- | ---- | 3.81 | 1.62 | .76 | ---- | ---- | 4.36 | ---- | ---- | 1.87 |
| Northrup N9-503 | ---- | ---- | 3.89 | 1.62 | .64 | ---- | ---- | 5.06 | ---- | ---- | 1.92 |
| Northrup N9-504 | ---- | ---- | 4.10 | 1.67 | .96 | ---- | ---- | 4.72 | ---- | ---- | 2.10 |
| P.A.G.F.D. 100 | ---- | ---- | 3.66 | 1.58 | .98 | ---- | ---- | 4.35 | ---- | ---- | 1.89 |
| Scandia | ---- | ---- | 3.70 | 1.15 | .52 | ---- | ---- | 4.20 | ---- | ---- | ---- |
| W. L. 200 | ---- | ---- | 3.87 | 1.49 | .59 | ---- | ---- | 5.06 | ---- | ---- | 1.76 |
| W. L. 300 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1.88 |
| W. L. 400 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1.52 |
| W. L. H. L. K. | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 2.14 |
| Test Average | 3.83 | 1.90 | 3.76 | 1.35 | .79 | 1.71 | 2.94 | 4.37 | 2.01 | 2.02 | 1.90 |
| L.S.D. (0.05) | ---- | ---- | .50 | .42 | .40 | .42 | N.S. | .65 | .45 | N.S. | .25 |
| (0.01) | ---- | ---- | .68 | N.S. | .54 | .57 | N.S. | .88 | .60 | N.S. | N.S. |

1/ Winterkilled and omitted from averages.

Table 14. Red clover variety test at the Main Experiment Station Brookings, South Dakota. Seeded 1959. Harvested 1960-61.

| Variety | Percent Stand May, 1961 | Dry tons per acre | | | | |
|---|---|---|---|---|---|---|
| | | 1960 | 1961 | | | Average |
| | | Total | 1st Cut | 2nd Cut | Total | Total |
| Chesapeake | 46 | 1.05 | 1.93 | .91 | 2.84 | 1.94 |
| Dollard | 88 | 2.11 | 4.31 | 1.12 | 5.42 | 3.76 |
| Kenland | 82 | 1.96 | 3.94 | 1.45 | 5.39 | 3.68 |
| Lakeland | 84 | 1.79 | 4.08 | 1.26 | 5.34 | 3.56 |
| LaSalle | 96 | 2.64 | 4.44 | 1.32 | 5.76 | 4.20 |
| Pennscott | 44 | 1.03 | 2.67 | 1.06 | 3.74 | 2.38 |
| Mean | | 1.76 | 3.56 | 1.19 | 4.75 | 3.26 |
| L.S.D. (0.05) | | N.S. | .94 | N.S. | N.S. | .38 |
| (0.01) | | N.S. | 1.30 | N.S. | N.S. | N.S. |

Table 15. Red Clover Variety Test at the Southeast Research Farm, Menno. Seeded 1957. Harvested 1958.

| Variety | Tons of dry forage per acre | Stand (%) | Height (Inches) |
|---|---|---|---|
| Dollard | 1.02 | 92 | 16 |
| Kenland | 0.97 | 95 | 16 |
| La Salle | 0.92 | 90 | 14 |
| Pennscott | 0.83 | 95 | 18 |
| Stevens | 0.82 | 95 | 16 |
| Wisconsin Synthetic | 0.92 | 90 | 16 |
| Average | 0.91 | 93 | 16 |
| L. S. D. (0.05) | 0.25 | | |

Table 16. Red Clover Variety Test at the Northeast Research Farm, Watertown. Seeded 1956. Harvested 1957-1958.

| Variety | Tons of dry forage per acre | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1957 | | | 1958 | | | Cumulative average | | |
| | 1st cut | 2nd cut | Total | 1st cut | 2nd cut | Total | 1st cut | 2nd cut | Total |
| Commercial Common | 1.02 | 0.36 | 1.38 | 1.83 | 0.76 | 2.59 | 1.42 | 0.56 | 1.98 |
| Commercial Mammoth | 1.26 | 0.24 | 1.49 | 2.26 | 0.49 | 2.75 | 1.76 | 0.36 | 2.12 |
| Dollard | 1.56 | 0.39 | 1.95 | 2.80 | 0.82 | 3.63 | 2.18 | 0.60 | 2.79 |
| Kenland | 1.12 | 0.44 | 1.25 | 2.01 | 0.41 | 2.92 | 1.56 | 0.68 | 2.24 |
| La Salle | 1.34 | 0.40 | 1.75 | 2.41 | 0.82 | 3.24 | 1.88 | 0.62 | 2.50 |
| Pennscott | 1.50 | 0.39 | 1.89 | 2.70 | 0.82 | 3.52 | 2.10 | 0.60 | 2.70 |
| Wegener | 1.56 | 0.46 | 2.02 | 2.80 | 0.98 | 3.79 | 2.18 | 0.72 | 2.91 |
| Wisconsin Synthetic | 1.38 | 0.42 | 1.81 | 2.49 | 0.76 | 3.13 | 1.94 | 0.59 | 2.47 |
| Average | 1.34 | 0.39 | 1.73 | 2.41 | 0.79 | 3.20 | 1.88 | 0.59 | 2.46 |

Table 17. Red Clover Variety Test at the Northeast Research Farm, Watertown. Seeded 1957. Harvested 1958.

| Variety | Tons of dry forage per acre |
|---|---|
| Dollard | 1.74 |
| Kenland | 1.14 |
| La Salle | 1.60 |
| Pennscott | 1.11 |
| Stevens | 1.06 |
| Wisconsin Synthetic | 1.50 |
| Average | 1.36 |
| L. S. D. (0.05) | 0.42 |

Table 18. Red Clover Variety Tests at Four Locations in South Dakota. Seeded 1959. Harvested 1960.

| Variety | Tons dry forage per acre | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Brookings | | | Eureka | Menno | | | Watertown | |
| | 1st cut | 2nd cut | Total | Total | 1st cut | 2nd cut | Total | Total | Average |
| Chesapeake | .85 | .20 | 1.05 | .92 | 1.88 | .82 | 2.71 | .55 | 1.31 |
| Dollard | 1.86 | .25 | 2.11 | .72 | 2.30 | .69 | 3.00 | .65 | 1.62 |
| Kenland | 1.68 | .28 | 1.96 | .81 | 2.49 | .80 | 3.30 | .66 | 1.68 |
| Lakeland | 1.45 | .34 | 1.79 | .39 | 2.50 | .71 | 3.22 | .70 | 1.52 |
| La Salle | 2.34 | .30 | 2.64 | .56 | 2.72 | .70 | 3.42 | .62 | 1.81 |
| Pennscott | .78 | .25 | 1.03 | .00 | 1.80 | .79 | 2.59 | .60 | 1.06 |
| Average | 1.49 | .27 | 1.76 | .57 | 2.29 | .75 | 3.04 | .63 | 1.50 |
| L.S.D. (0.05) | .68 | N.S. | N.S. | .30 | N.S. | N.S. | N.S. | N.S. | .49 |
| (0.01) | .94 | N.S. | N.S. | .47 | N.S. | N.S. | N.S. | N.S. | N.S. |

Table 19. Average Annual Tons of Dry Forage Produced by Red Clover Varieties in South Dakota.

| Variety | Brookings | | | Eureka | Menno | | Watertown | | | | Number Harvest Years | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1953 | 1960 | 1961 | 1960 | 1958 | 1960 | 1957 | 1958 | 1958 | 1960 | | |
| Chesapeake | ---- | 1.05 | 2.84 | .92 | ---- | 2.71 | ---- | ---- | ---- | .55 | 5 | 1.62 |
| Dollard | 1.56 | 2.11 | 5.42 | .72 | 1.02 | 3.00 | 1.95 | 3.63 | 1.74 | .65 | 10 | 2.18 |
| Emerson | .95 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1 | .95 |
| Kenland | .72 | 1.96 | 5.39 | .81 | .97 | 3.30 | 1.25 | 2.92 | 1.14 | .66 | 10 | 1.92 |
| Lakeland | ---- | 1.79 | 5.34 | .39 | .92 | 3.22 | 1.81 | 3.13 | 1.50 | .70 | 9 | 2.09 |
| La Salle | ---- | 2.64 | 5.76 | .56 | .92 | 3.42 | 1.75 | 3.24 | 1.60 | .62 | 9 | 2.28 1/ |
| Libel | 1.26 | ---- | ---- | ----- | ---- | ---- | ---- | ---- | ---- | ---- | 1 | 1.26 |
| Mammoth | 1.19 | ---- | ---- | ---- | ---- | ---- | 1.49 | 2.75 | ---- | ---- | 3 | 1.81 |
| Midland | .90 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1 | .90 |
| Ottawa | 1.08 | ---- | ---- | ----- | ---- | ---- | ---- | ---- | ---- | ---- | 1 | 1.08 |
| Pennscott | ---- | 1.03 | 3.74 | .00 | .83 | 2.59 | 1.89 | 3.52 | 1.11 | .60 | 9 | 1.70 |
| Rahn | .96 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1 | .96 |
| Scott | .65 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1 | .65 |
| Stevens | ---- | ---- | ---- | ---- | .82 | ---- | ---- | ---- | 1.06 | ---- | 2 | .94 |
| Van Fossen | .79 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1 | .79 |
| Wegener | 1.10 | ---- | ---- | ---- | ---- | ---- | 2.02 | 3.79 | ---- | ---- | 3 | 2.30 |
| Average | 1.01 | 1.76 | 4.75 | .57 | .91 | 3.04 | 1.73 | 3.20 | 1.36 | .63 | | |
| L.S.D. (0.05) | .32 | N.S. | .38 | .30 | .25 | N.S. | N.S. | N.S. | .42 | N. S. | | |

1/ La Salle is a blend of Dollard and Ottawa.

Table 20. Sweetclover Variety Test at the Main Experiment Station, Brookings. Seeded 1952. Harvested 1953.

| Variety | Tons of dry forage per acre | Height at Harvest | Blackstem score 1/ |
|---|---|---|---|
| Arctic | 3.15 | 48" | 5.0 |
| Brandon Dwarf | 3.56 | 31" | 5.0 |
| Common white | 3.47 | 73" | 4.0 |
| Common yellow | 3.68 | 62" | 5.0 |
| Evergreen | 4.02 | 85" | 3.0 |
| Madrid | 3.40 | 55" | 4.0 |
| Spanish | 3.90 | 70" | 4.5 |
| Average | 3.60 | 61" | 4.4 |
| L. S. D. (0.05) | .47 | | |

1/ 1 = resistant
5 = susceptible

Table 21. Yields and Nitrogen Production of Sweetclover Varieties at the Main Experiment Station, Brookings. Seeded 1954. Harvested 1954.

| Strain | Tops | | | Roots | | | Total |
|---|---|---|---|---|---|---|---|
| | Tons per A. | Percent nitrogen | Lbs. N per acre | Lbs. per A. | Percent nitrogen | Lbs. N per acre | Lbs. N per acre |
| Spanish | 2.28 | 2.99 | 136.34 | 2929 | 2.99 | 87.58 | 223.92* |
| Willamette | 1.79 | 2.75 | 98.45 | 1861 | 2.77 | 51.55 | 150.00 |
| Common White | 0.81 | 3.13 | 50.71 | 2377 | 3.04 | 72.26 | 122.97 |
| Common Yellow | 0.97 | 3.09 | 59.95 | 2671 | 2.69 | 71.85 | 131.80 |
| Com.Yel. Sel. | 1.32 | 2.85 | 75.24 | 2443 | 2.76 | 67.43 | 142.67 |
| Madrid | 1.70 | 2.93 | 99.62 | 2533 | 2.48 | 62.82 | 162.44 |
| Evergreen | 1.68 | 2.87 | 96.43 | 2604 | 2.86 | 74.47 | 170.90 |
| Wis. A46 | 1.48 | 2.71 | 80.22 | 2605 | 2.58 | 67.21 | 147.43 |
| N1 | 1.57 | 3.02 | 94.82 | 1627 | 3.02 | 49.14 | 143.96 |
| N7 | 1.51 | 3.09 | 93.32 | 1560 | 3.14 | 48.98 | 142.30 |
| N9 | 1.30 | 2.98 | 77.48 | 1597 | 3.14 | 50.15 | 127.63 |
| *M. wolgica* | 1.12 | 3.39 | 75.94 | 984 | 2.69 | 26.47 | 102.41 |
| *M. taurica* | 0.52 | 2.97 | 30.89 | 798 | 3.08 | 24.58 | 55.47 |
| Israel | 2.41 | 2.48 | 119.54 | 1200 | 1.02 | 12.24 | 131.78 |
| Hubam | 1.80 | 2.64 | 95.04 | 480 | 0.64 | 3.07 | 98.11 |

* Data from one replication only.

Table 22. Yields of Tops and Roots of Sweetclover Varieties at the Main Experiment Station, Brookings. Seeded 1954. Harvested 1955

| Strain | 1955 data - pounds of dry matter per acre | | | | | |
|---|---|---|---|---|---|---|
| | May 5, 1955 | | June 16, 1955 | | Sept. 1, 1955 | |
| | Roots | Tops | Roots | Tops | Roots | Tops |
| Spanish | 480.2 | 828.3* | 2040.7* | 5653.9* | 1320.4* | 5161.7* |
| Willamette | 1272.4 | 822.3 | 1746.6 | 4219.7 | 696.2 | 5233.8 |
| Common White | 1602.5 | 1320.4 | 1824.6 | 3283.1 | 893.3 | 4045.4 |
| Common Yellow | 2586.9 | 1776.6 | 2700.9 | 5419.8 | 432.1 | 4705.6 |
| Com.Yel. Sel. | 2022.7 | 1560.5 | 1668.6 | 4909.6 | 540.2 | 5779.9 |
| Madrid | 1500.5 | 780.3 | 1686.6 | 4003.3 | 576.2 | 3577.2 |
| Evergreen | 1656.5* | 708.2 | 2808.9* | 4033.3* | 1656.6* | 5701.9* |
| Wis. A46 | 1182.4 | 696.2 | 2911.0 | 4867.6 | 972.3 | 3841.3 |
| N1 | 1374.5 | 636.2 | 1152.4 | 1944.6 | 660.2 | 3493.2 |
| N7 | 846.3* | 144.0* | 642.2* | 1080.4* | 564.2* | 2280.8* |
| N9 | 1128.4 | 444.1 | 1152.4 | 1320.4 | 804.3* | 3109.1* |
| *M. wolgica* | 678.2 | 654.2 | 1716.6 | 4033.3 | 852.3 | 4141.4 |
| *M. taurica* | 522.2 | 702.2 | 1134.4 | 1842.6 | 552.2 | 2460.8 |

* Data from one replication only.

Table 23. Sweetclover variety Test at the Main Experiment Station, Brookings. Seeded 1955. Harvested 1955.

| Variety | Tons of dry forage per acre | Tons of dry roots per acre | Height (inches) |
|---|---|---|---|
| Common White | 1.00 | 2.23 | 22 |
| Common Yellow | 1.09 | 2.26 | 14 |
| Evergreen | 1.02 | 3.29 | 29 |
| Madrid | 1.09 | 2.64 | 23 |
| Spanish | 1.08 | 4.14 | 28 |
| Average | 1.06 | 2.91 | 23 |
| Golden (annual) | 1.29 | 0.76 | 40 |
| Israel (annual) | 1.03 | 0.98 | 47 |
| Average | 1.16 | 0.87 | 44 |

Table 24. Sweetclover Variety Test at the Main Experiment Station, Brookings. Seeded 1958. Harvested 1958.

| Variety | Tons of dry forage per acre |
|---|---|
| Common White | 1.77 |
| Common Yellow | 1.98 |
| Erector | 0.80 |
| Evergreen | 2.42 |
| Goldtop | 2.04 |
| Madrid | 0.38 |
| Spanish | 1.93 |
| Average | 1.62 |
| Floranna (annual) | 7.53 |
| Hubam (annual) | 3.04 |
| Israel (annual) | 2.72 |
| Average | 3.99 |

Table 25. Summary of Second Year Notes on the Northern Great Plains Observational Sweetclover Nursery at Brookings, South Dakota. Seeded 1959. 1 = Most desirable. 5 = Least Desirable.

| Variety or Strain | June 1, 1960 | | July 1,1960 | Sept. 7,1960 |
|---|---|---|---|---|
| | Stand | Vigor | Forage Yield | Seed Yield |
| N 1 | 4.0 | 4.0 | 4.0 | 3.5 |
| R 218-1-1 | 3.5 | 4.0 | 3.0 | 1.0 |
| P 443B4 | 2.0 | 2.5 | 2.5 | 1.5 |
| T 151-11 | 2.5 | 3.0 | 3.0 | 1.5 |
| Evergreen | 2.0 | 3.5 | 2.5 | 1.0 |
| W-7 | 2.5 | 2.5 | 3.0 | 1.5 |
| W-31 | 3.0 | 2.0 | 3.0 | 1.5 |
| Spanish | 1.0 | 1.5 | 2.0 | 1.5 |
| Cumino | 3.0 | 4.0 | 4.5 | 4.0 |
| Common White | 3.0 | 3.0 | 3.5 | 2.5 |
| Arctic | 4.0 | 3.5 | 3.5 | 2.0 |
| T 161-2 | 2.0 | 3.5 | 3.5 | 1.5 |
| S 34-6 | 3.5 | 3.5 | 3.0 | 1.0 |
| R 218-1 | 2.5 | 3.5 | 3.0 | 1.5 |
| Erector | 1.5 | 2.0 | 1.5 | 2.0 |
| Common Yellow | 2.0 | 2.5 | 1.5 | 1.5 |
| N 13 | 1.5 | 2.0 | 2.0 | 2.0 |
| N 14 | 1.0 | 1.0 | 2.0 | 2.0 |
| Goldtop | 1.0 | 1.5 | 1.5 | 2.5 |
| Madrid | 1.0 | 1.5 | 1.0 | 1.0 |
| Average | 2.3 | 2.7 | 2.7 | 1.8 |

Table 26. Summary of first year notes on the Northern Great Plains Uniform Sweetclover nursery at Brookings, South Dakota. Seeded May 12, 1961 in single rows spaced at 42".

| Variety | Scores | | | | | |
|---|---|---|---|---|---|---|
| | Seedling Stand | Growth Type | Disease | | Forage | |
| | | | Leaf | Stem | Yield | Quality |
| Arctic | 5.0 | 4.0 | 2.0 | 2.5 | 3.5 | 3.0 |
| Common White | 2.5 | 3.5 | 2.0 | 2.0 | 4.0 | 1.5 |
| Common Yellow | 1.5 | 3.5 | 2.0 | 2.0 | 2.0 | 1.5 |
| Cumino | 3.0 | 1.0 | 2.0 | 2.0 | 5.0 | 2.5 |
| Denta | 2.0 | 1.5 | 2.0 | 2.0 | 2.5 | 3.5 |
| Erector | 3.0 | 3.5 | 2.0 | 2.0 | 4.5 | 1.0 |
| Evergreen | 3.0 | 2.0 | 2.0 | 2.0 | 2.0 | 3.5 |
| Goldtop | 2.0 | 3.5 | 2.0 | 2.0 | 1.0 | 2.5 |
| Madrid | 4.0 | 3.0 | 2.0 | 2.0 | 2.0 | 3.0 |
| N 13 | 2.0 | 2.0 | 2.0 | 4.5 | 2.5 | 1.5 |
| Spanish | 3.0 | 2.0 | 2.0 | 2.0 | 1.0 | 2.5 |
| Floranna | 3.0 | 1.0 | 2.0 | 2.0 | 2.0 | 4.0 |
| Golden Annual | 2.0 | 1.0 | 2.0 | 1.5 | 3.0 | 2.5 |
| Hubam | 2.0 | 1.0 | 2.5 | 2.5 | 2.5 | 4.0 |
| Israel Annual | 3.5 | 1.0 | 2.5 | 2.0 | 5.0 | 4.0 |

Characters and Method of Scoring

| Character | Score | |
|---|---|---|
| | 1 | 5 |
| Seedling Stand | Good | Poor |
| Growth Type | Upright | Prostate |
| Disease | None | Heavy |
| Forage Yield | High | Low |
| Forage Quality | Leafy, fine stemmed | Few leaves, coarse stemmed |

Table 27. Summary of the performance of varieties included in the 1960 Regional Sweetclover trials at Brookings, South Dakota. Seeded 1960. Harvested 1961.

| Variety | 1961 Stand (%) | Dry Yield per acre (Tons) |
|---|---|---|
| Arctic | 44 | 1.07 |
| Common White | 86 | 2.01 |
| Common Yellow | 88 | 2.33 |
| Cumino | 76 | 1.34 |
| Denta (W31) | 92 | 2.08 |
| Evergreen | 90 | 2.11 |
| Goldtop | 90 | 2.29 |
| Madrid | 96 | 2.43 |
| *M. officinalis* | 97 | 2.19 |
| Spanish | 80 | 2.23 |
| W7 Intermediate coumarin | 95 | 2.19 |
| Average | 85 | 2.02 |
| L.S.D. (0.05) | | .42 |
| (0.01) | | .56 |

Table 28. Summary of Second Year Notes on the Northern Great Plains Observational Sweetclover Nursery at Highmore, South Dakota. Seeded 1959. 1 = Most desirable. 5 = Least desirable.

| Entry | May 11, 1960 | | July 18, 1960 | August 10, 1960 |
|---|---|---|---|---|
| | Stand | Vigor | Forage Yield | Seed Yield |
| N 1 | 4.5 | 5.0 | 3.5 | 3.0 |
| R 218-1-1 | 3.5 | 2.5 | 2.0 | 3.0 |
| P443B4 | 2.0 | 3.0 | 1.5 | 2.5 |
| T151-11 | 1.0 | 3.5 | 1.5 | 2.5 |
| Evergreen | 2.0 | 2.0 | 1.5 | 2.5 |
| W 7 | 3.5 | 2.5 | 2.5 | 3.0 |
| W 31 | 2.5 | 2.0 | 2.0 | 3.5 |
| Spanish | 3.5 | 1.5 | 1.0 | 1.0 |
| Cumino | 2.0 | 3.5 | 3.0 | 4.0 |
| Common White | 2.0 | 2.5 | 1.5 | 1.0 |
| Arctic | 4.0 | 2.5 | 3.0 | 2.0 |
| T161-2 | 3.0 | 1.5 | 2.0 | 2.5 |
| S34-6 | 2.0 | 2.5 | 3.0 | 3.0 |
| R218-1 | 2.0 | 3.0 | 1.5 | 2.5 |
| Erector | 4.5 | 2.5 | 2.5 | 1.5 |
| Common Yellow | 2.5 | 2.0 | 2.5 | 1.0 |
| N 13 | 1.5 | 1.0 | 5.0 | 3.0 |
| N 14 | 1.5 | 1.5 | 5.0 | 2.5 |
| Goldtop | 3.5 | 3.5 | 1.0 | 2.0 |
| Madrid | 3.0 | 3.0 | 3.5 | 1.5 |
| Average | 2.7 | 2.6 | 2.4 | 2.8 |

Table 29. Sweetclover Variety Test at the Southeast Research Farm, Menno. Seeded 1956. Harvested 1957.

| Variety | Tons of dry forage per acre |
|---|---|
| Common White | 3.24 |
| Common Yellow | 4.48 |
| Evergreen | 3.72 |
| Goldtop | 4.41 |
| Madrid | 4.08 |
| Spanish | 4.42 |
| Average | 4.06 |

Table 30. Sweetclover Variety Test at the Southeast Research Farm, Menno. Seeded 1957. Harvested 1958.

| Variety | Tons dry forage per acre | Stand (%) | Height (Inches) |
|---|---|---|---|
| Evergreen | 2.63 | 90 | 53 |
| Goldtop | 2.54 | 94 | 47 |
| Intermediate Coumarin | 2.57 | 92 | 44 |
| Madrid | 1.27 | 90 | 38 |
| Spanish | 2.39 | 94 | 46 |
| Average | 2.28 | 92 | 46 |
| L. S. D. (0.05) | 0.28 | | |

Table 31. Summary of Second Year Notes on the Northern Great Plains Observational Sweetclover Nursery at Presho, South Dakota. Seeded 1959. 1 = Most desirable. 5 = Least desirable.

| Entry | May 12, 1960 | |
|---|---|---|
| | Stand | Vigor |
| N 1 | 3.0 | 5.0 |
| R 218-1-1 | 5.0 | 3.0 |
| P443B4 | 4.0 | 3.0 |
| T151-11 | 5.0 | 4.0 |
| Evergreen | 5.0 | 3.0 |
| W 7 | 2.0 | 2.0 |
| W 31 | 4.0 | 5.0 |
| Spanish | 1.0 | 1.0 |
| Cumino | 5.0 | 5.0 |
| Common White | 3.0 | 3.0 |
| Arctic | 5.0 | 5.0 |
| T161-2 | 2.0 | 2.0 |
| S34-6 | 4.0 | 4.0 |
| R 218-1 | 4.0 | 2.0 |
| Erector | 5.0 | 5.0 |
| Common Yellow | 5.0 | 4.0 |
| N 13 | 4.0 | 3.0 |
| N 14 | 4.0 | 3.0 |
| Goldtop | 4.0 | 4.0 |
| Madrid | 4.0 | 3.0 |
| Average | 3.9 | 3.4 |

Table 32. Summary of the performance of varieties included in the 1960 Regional Sweetclover trials at Watertown, South Dakota. Seeded 1960. Harvested 1961.

| Variety | 1961 Stand (%) | Dry Yield per acre (Tons) |
|---|---|---|
| Arctic | 82 | 1.25 |
| Common White | 90 | 1.52 |
| Common Yellow | 94 | 1.72 |
| Cumino 1/ | 66 | .58 |
| Denta (W31) 1/ | 88 | .91 |
| Evergreen | 94 | 1.48 |
| Goldtop | 92 | 1.44 |
| Madrid | 98 | 1.69 |
| M. officinalis | 98 | 1.34 |
| Spanish | 88 | 1.43 |
| W7 Intermediate coumarin | 92 | 1.35 |
| Average | 89 | 1.34 |
| L.S.D. (0.05) | | .21 |
| (0.01) | | .29 |

1/ Completely defoliated by blister beetles.

Table 33. Average tons of dry matter per acre produced during the second year of growth by sweetclover varieties at several locations in South Dakota.

| Variety | Location: | Brookings | Cottonwood | Eureka | Menno | Watertown | | Average |
|---|---|---|---|---|---|---|---|---|
| | Year: | 1961 | 1960 | 1960 | 1960 | 1960 | 1961 | |
| Common White | | 2.01 | 2.10 | .82 | 2.30 | 1.62 | 1.52 | 1.73 |
| Common Yellow | | 2.33 | 2.16 | 1.12 | 2.54 | 1.88 | 1.72 | 1.96 |
| Denta (W31) | | 2.08 | 2.27 | 1.19 | 1.56 | 1.28 | .91[1/] | 1.55 |
| Evergreen | | 2.11 | 2.16 | .87 | 2.26 | 1.77 | 1.48 | 1.78 |
| Goldtop | | 2.29 | 2.54 | .63 | 2.95 | 2.04 | 1.44 | 1.98 |
| Madrid | | 2.43 | 2.47 | 1.14 | 2.58 | 1.80 | 1.69 | 2.02 |
| M. officinalis | | 2.19 | 2.23 | 1.36 | 1.82 | 1.84 | 1.34 | 1.80 |
| Spanish | | 2.23 | 2.13 | .96 | 2.17 | 1.77 | 1.43 | 1.78 |
| W7 Intermediate Coumarin | | 2.19 | 2.12 | 1.36 | 2.19 | 1.77 | 1.35 | 1.83 |
| Average of Test | | 2.02 | 2.24 | 1.05 | 2.41 | 1.75 | 1.34 | 1.82 |
| L.S.D. | (0.05) | .42 | N.S. | N.S. | .41 | N.S. | .21 | .26 |
| | (0.01) | .56 | N.S. | N.S. | .56 | N.S. | .29 | N.S. |

1/ Completely defoliated by blister beetles.

Table 34. Birdsfoot Trefoil Variety Test at the Main Experiment Station, Brookings. Seeded 1951. Harvested 1952 and 1953.

| Variety | Tons of dry forage per acre 1952 | 1953 |
|---|---|---|
| Cascade | 1.90 | 1.49 |
| Empire | 2.66 | 1.73 |
| Granger | 1.90 | 1.54 |
| Mandan 1116 | 2.36 | 1.36 |
| New York Narrowleaf 1/ | 1.24 | -- |
| Oregon Narrowleaf 1/ | 1.35 | -- |
| Viking | 2.01 | 1.91 |
| Average | 1.92 | 1.61 |

1/ Winterkilled and not harvested in 1953.

Table 35. Birdsfoot Trefoil Test at the Southeast Research Farm, Menno. Seeded 1957. Harvested 1958.

| Variety | Tons of dry forage per acre | Stand (%) |
|---|---|---|
| Cascade | 0.66 | 80 |
| Empire | 0.82 | 94 |
| French Imported | 0.79 | 92 |
| Granger | 0.77 | 91 |
| Iowa Empire 2297 | 0.16 | 85 |
| Iowa Empire 2306 | 0.67 | 91 |
| Italian Imported | 0.74 | 95 |
| Leofoil | 0.38 | 92 |
| Mansfield | 0.62 | 86 |
| South Dakota #9 | 0.12 | 92 |
| Tana | 0.84 | 91 |
| Viking | 1.01 | 85 |
| Average | 0.63 | 90 |
| L. S. D. (0.05) | 0.27 | |

Table 36. Birdsfoot Trefoil Variety Test at the Northeast Research Farm, Watertown. Seeded 1957. Harvested 1958.

| Variety | Tons of dry forage per acre |
|---|---|
| Cascade | 0.61 |
| Douglas | 0.59 |
| Empire F.C. 32080 | 1.04 |
| Granger | 0.45 |
| Imported | 0.46 |
| Iowa Empire 2297 | 0.70 |
| Iowa Empire 2306 | 0.99 |
| Mansfield | 0.74 |
| Tana | 0.64 |
| Viking | 0.72 |
| Average | 0.69 |
| L. S. D. (0.05) | 0.34 |

Table 37. Average Tons Per Acre of Oven Dry Forage Produced by Birdsfoot Trefoil Varieties at Cottonwood, Menno and Watertown, South Dakota. Seeded 1959. Harvested 1960.

| Variety | Cottonwood | Menno | | | Watertown | |
|---|---|---|---|---|---|---|
| | Total | 1st cut | 2nd cut | Total | Total | Mean |
| Cascade | .42 | .49 | .59 | 1.08 | 1.25 | .92 |
| Douglas | .50 | .63 | .52 | 1.15 | 1.10 | .92 |
| Empire | .48 | .30 | .37 | .67 | 1.75 | .97 |
| Fargo | .40 | .27 | .33 | .60 | .98 | .66 |
| French | .51 | .39 | .56 | .95 | .85 | .77 |
| Granger | .54 | .36 | .56 | .92 | 1.30 | .92 |
| Mansfield | .52 | .40 | .46 | .86 | 1.08 | .82 |
| Tana | .35 | .76 | .81 | 1.57 | 2.50 | 1.47 |
| Viking | .54 | .60 | .49 | 1.09 | 1.00 | .88 |
| Mean | .47 | .47 | .52 | .99 | 1.31 | .92 |
| L.S.D. | | | | | | |
| (0.05) | N.S. | N.S. | .26 | .17 | N.S. | N.S. |
| (0.01) | N.S. | N.S. | .35 | .25 | N.S. | N.S. |

Table 38. Characteristics of those forage legume varieties eligible for certification and recommended for use in South Dakota in areas where they are adapted.

| Variety | Characteristics |
|---|---|
| Alfalfa: | |
| 1. Ladak | Yields exceptionally well in the first cutting of the season but is inferior to Ranger and Vernal in the second cutting. Ladak has a semiprocumbent habit of growth and becomes dormant during prolonged periods of summer drought and in early fall. Not as resistant to wilt as Ranger and Vernal and frequently subject to foliage diseases. Ladak is very winter hardy. |
| 2. Rambler | Rambler may be described as being creeping-rooted with a low-set crown. It is comparatively drought resistant and very winter hardy. Plants of Rambler have persisted well under grazing in South Dakota. It is more resistant to bacterial wilt than Ladak but not as resistant as Vernal. Rambler yields less forage than either Ranger or Vernal but more than Teton. It resembles Teton in that recovery after cutting is slow and the most forage is obtained from the first cutting. The production of seed by Rambler is estimated to be 60 per cent of that of Ladak. Rambler is being recommended for inclusion as the legume component of tame pasture mixtures throughout the state. |
| 3. Ranger | A variegated variety in which the growth habit varies from erect to decumbent. Ranger recovers after cutting faster than Ladak and is an excellent seed producer. Susceptible to leaf spot diseases but is wilt resistant. Sufficiently winter hardy for use anywhere in South Dakota under normal conditions. |
| 4. Teton | A variety developed primarily for grazing alone or in grass mixtures. Teton has low, wide crowns with aggressive rhizome development. It possesses a satisfactory level of resistance to wilt and to many foiliage diseases and is more winter hardy than any of the other varieties recommended for use in South Dakota. Teton will give comparatively high forage yields at the time of the first hay cutting but recovers rather slowly and enters fall dormancy quite early. An excellent variety for use in pasture mixtures. |
| 5. Vernal | An outstanding hay variety possessing fine-stemmed, leafy, dark green foiliage and relatively broad crowns. Resembles Cossack in recovery after cutting and fall dormancy. Vernal possesses a high level of winter hardiness and resistance to bacterial wilt. It is tolerant to several foiliage diseases and is superior in its ability to produce high yields of quality forage. |

Table 38 (Continued)

| Variety | Characteristics |
|---|---|
| **Red Clover:** | |
| Dollard | Dollard red clover was developed in Canada to meet the need for a strain less subject to winter killing and with more dependable performance characteristics from year to year. It has more resistance to northern anthracnose than Midland and many other northern strains. Not distinguishable from other double-cut varieties on the basis of vegetative characteristics. Average seed production ability. |
| **Sweetclover:** | |
| 1. Madrid | Good seedling vigor, medium height, and comparatively leafy and fine stemmed. Earlier than most common varieties and a dependable seed producer. A biennial variety. |
| 2. Goldtop | Characteristics similar to Madrid but has the advantage of lower coumarin content. Slightly later in maturity than Madrid and somewhat more resistant to the blackstem disease. |
| **Trefoil:** | |
| Empire | Empire is an improved variety of birdsfoot trefoil best adapted for use in pasture mixtures in the southeastern part of South Dakota. Trefoil is not as winter hardy as alfalfa and the area of adaptation in the state has not been well defined. |